Pre-Order (PO) Data Collection System Design for Imported Outfits in the Isaura Collection

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Abstract

This research aims to develop a pre-order (PO) data collection system for imported outfits at Isaura Collection, Medan, to overcome the problems of inefficient and error-prone order recording. The background of the problem shows that the manual process causes delivery errors, delays, and customer dissatisfaction. This system is designed using Flutter technology for the user interface and Pocketbase as the backend for efficient data management. The development methodology uses Waterfall with a qualitative approach, including requirements analysis, design, implementation, testing (blackbox), and maintenance. This system allows customers to order imported outfits through a mobile application, manage order data, and generate transaction reports. The contribution of this research is an increase in operational efficiency, a reduction in recording errors, and an increase in customer satisfaction. The results are expected to meet the ISO 25010 quality standard with a focus on system performance efficiency and functionality.

Keywords: Data Collection System, Flutter, PocketBase, Transaction Reports, Waterfall Methodology.

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Introduction

Isaura Collection is an UMKM in Medan that specializes in selling imported outfits through a pre-order (PO) system. Currently, the PO process is still done manually using notebooks and Excel spreadsheets that are not integrated. This manual method often leads to recording errors such as incorrect sizes, colors, or customer order quantities (Akbar & Irawan, 2021). As a result, there are shipments that do not match orders, transaction cancellations, and decreased customer satisfaction. Additionally, managing imported goods arriving from overseas is highly complex due to the absence of a real-time tracking system (Andriana & Lestari, 2022). The payment verification process and order status updates take an average of 2-3 days (Adiwinoto et al., 2020). "Design of a Pre-Order Data System for Imported Outfits at Isaura Collection" was proposed due to the urgent need for digital transformation among local UMKM in Medan..

The import fashion business in Indonesia is growing rapidly in line with increasing consumer demand for international quality products (Perwitasari et al., 2023). Isaura Collection faces fierce competition from large e-commerce platforms that already have advanced digital PO systems. Manual recording causes important data to be lost when goods arrive from suppliers or when customers confirm payment. The implementation of the FIFO (First In First Out) principle for order delivery is often disrupted because the data is not chronologically ordered (Kurniawan et al., 2022). Customers also complain about the difficulty of tracking the status of their PO independently (Khoerulloh & Hidayah, 2023). The urgency of this research is evident from the potential increase in Isaura Collection's revenue of up to 35% if the digital system is implemented properly. The benefits are not only operational efficiency but also increased customer loyalty through faster and more accurate service.

Based on two weeks of field observations at Isaura Collection, it was found that the monthly PO volume reached 75-120 orders with a recording error rate of 22%. These errors resulted in return costs of IDR 5,000,000 per month and stock losses due to mismanagement. The manual system does not support automatic notifications to customers when imported goods are ready for shipment. The integration of information with overseas suppliers is also hampered by non-standard data formats. Similar research by (Rosella et al., 2024) shows that digitizing the ordering system can reduce processing time by up to 65%. This phenomenon is highly relevant to the development of fashion UMKM in North Sumatra, which require affordable technological solutions. This research will provide both practical and academic contributions to the development of mobile information systems for UMKM.

The problem of PO system inefficiency is not only found in Isaura Collection but is also a common phenomenon in other imported fashion UMKM in Medan. The lack of an integrated system causes overstock or understock of imported goods, which results in significant financial losses. Customers often complain about delays in order status updates and unclear delivery schedules. Digitalization is an absolute solution, as proven in the research by (Bororing & Gunawan, 2024) which integrates payment APIs. However, in the context of imported outfit PO, detailed data on specific product variants is required. The urgency of this research is supported by data showing that 68% of fashion UMKM fail to reach the national scale due to poor inventory management. The academic benefit of this research is the enrichment of literature on the Flutter-Pocketbase mobile application for Indonesian UMKM.

Literature Review
2.1. Related Research

Research by (Rosella et al., 2024) developed a web-based ordering system using QR Code technology and the FIFO method. This system improved operational efficiency by up to 85.47% based on ISO 25010, with blackbox testing achieving 100% functionality. However, this system focuses on food ordering and does not include order tracking.

(Bororing & Gunawan, 2024) developed a web-based food ordering and payment system with Xendit API integration. Using the Agile method, this system reduces operational costs and improves customer experience, but does not support automatic transaction reporting features.

(Rachman et al., 2023) developed a web-based wedding organizer management information system using Laravel and MySQL. This system simplifies the booking of service packages, but is not optimized for mobile platforms.

(Herdiansah et al., 2024) developed a self-ordering system for Mimi Cakes & Cookies UMKM using CodeIgniter. This system solves the problem of manual recording, but does not provide an order tracking feature.

(Chandra et al., 2024) built a web-based pre-order system for Korean imports using the Waterfall method. This system meets the ISO 9126 standard with a response time of 3.75 seconds, but it is not implemented on a mobile platform.

2.2. Information System

An information system is an organized combination of people, hardware, software, communication networks, and data resources that collect, transform, and disseminate information within an organization (Fachri, Rizal, et al., 2023). In the context of retail, information systems support the management of customer data, orders, and transactions to improve operational efficiency. Mobile-based information systems enable real-time access to data, which is important for businesses such as Isaura Collection. These systems must be designed with usability and reliability in mind to ensure ease of use and data reliability. The implementation of information systems in pre-orders can reduce recording errors and speed up the transaction process, as evidenced by (Chandra et al., 2024) research on the pre-order system for imported Korean goods.

2.3. Flutter Technology

Flutter is an open-source framework from Google for cross-platform application development (Nelly Sofi & Riza Dharmawan, 2022). Flutter uses the Dart programming language and enables the development of responsive user interfaces for Android and iOS from a single codebase (Idan Arb & Al-Majdi, 2020). Flutter's strengths lie in its performance, which is close to that of native applications, and its ability to create custom widgets (Sharma et al., 2022). In the context of this research, Flutter was used to build an intuitive user interface for Isaura Collection customers. Research by (Herdiansah et al., 2024) shows that frameworks such as Flutter can accelerate the development of self-ordering applications with user-friendly interfaces.

2.4. Pocketbase

Pocketbase is a lightweight open-source backend that supports real-time data management (Sitorus et al., 2025). Pocketbase provides a SQLite database, RESTful API, and built-in authentication, making it suitable for small to medium-sized applications. In this study, Pocketbase was used to store order data, customer data, and transaction reports. The advantages of Pocketbase are its ease of integration with Flutter and its ability to handle CRUD (Create, Read, Update, Delete) efficiently. Similar research by (Bororing & Gunawan, 2024) shows that API-based backends can improve data management efficiency in ordering systems.

2.5. Waterfall Method

The Waterfall method is a sequential software development approach consisting of analysis, design, implementation, testing, and maintenance stages (Wijaya & Utomo, 2023). This method is suitable for projects with clear requirements, such as the development of a pre-order data system at Isaura Collection. Each stage is completed before starting the next stage, ensuring neat and structured documentation. Research by (Chandra et al., 2024) used the Waterfall method to develop a web-based pre-order system, resulting in a functional system with a good ISO 9126 score.

2.6. Blackbox Testing

Blackbox testing is a software testing method that focuses on functionality without considering the internal code structure (Maulida et al., 2025). This test involves examining the system's inputs and outputs to ensure that all features work according to specifications. In this study, blackbox testing was used to test the ordering, order tracking, and transaction report features. Research by (Zen et al., 2024) shows that blackbox testing can ensure that the system's functionality meets user requirements up to 100%.

2.7. Database Normalization

Database normalization is the process of organizing data to eliminate redundancy and ensure data integrity (Hardinata et al., 2024). Normalization to 3NF (Third Normal Form) ensures that each table has clear functional dependencies. In this study, the database was designed to store customer, order, and product information with a normalized structure (Damayanti et al., 2025). Research by (Fachri, Hendry, et al., 2023) shows that normalized databases can improve the efficiency of data management in information systems.

2.8. Pre-Order System

The pre-order system allows customers to order products before they are available, which is commonly used in the import retail business (Chandra et al., 2024). This system requires accurate order data management and transparent order status tracking. Key features include ordering, tracking, and transaction reporting. Research by (Herdiansah et al., 2024) shows that a self-ordering system can reduce recording errors and increase customer satisfaction.

2.9. User Interface

A good user interface (UI) should be intuitive, responsive, and support an optimal user experience (Diamanti Samantha & Nini Anggalih, 2024). In developing a pre-order system, the interface is designed to make it easy for customers to place and track orders. Flutter supports the creation of a consistent UI across multiple platforms. Research by (Bororing & Gunawan, 2024) shows that web-based interfaces can improve ordering efficiency and customer satisfaction.

Research Methodology

The data collection system for pre-orders of imported outfits at Isaura Collection is currently still done manually using physical records and third-party applications such as spreadsheets. This process causes several obstacles, such as difficulties in tracking pre-order status, managing customer data, and generating real-time reports. The lack of integration between product, customer, payment, and shipping data causes time inefficiencies and the risk of input errors. In addition, the absence of a centralized system makes it difficult for staff to accurately monitor product stock and shipping status. A web-based system using Flutter and Pocketbase is proposed to address these issues by providing an integrated solution that supports CRUD data, automated reports, and role-based access.
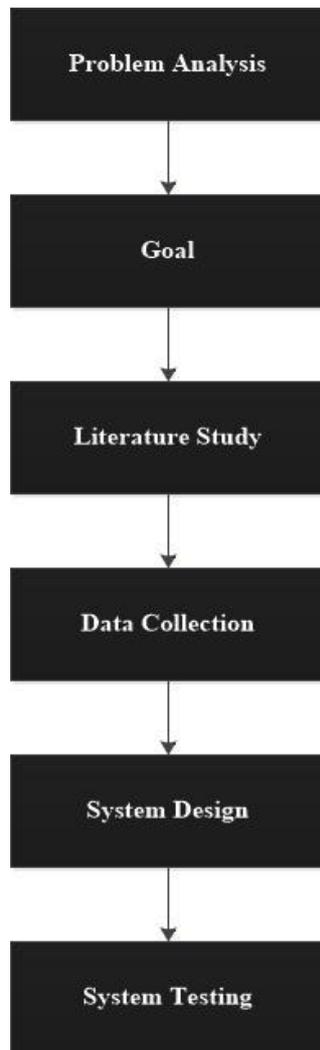
Figure 1. Research Stages

Figure 1 shows "Pre-Order (PO) Data Collection System Design for Imported Outfits in the Isaura Collection" began with Problem Analysis, which mapped out the core issues scattered manual recording, incorrect variants/sizes, unclear order status, slow recap, and the context of the import business (exchange rates, MOQ, ETA) and then translated them into specific and measurable Goals: PO data centralization, end-to-end status tracking, error reduction, and KPI-based rapid reporting. Next, the Literature Study provides a theoretical foundation for best practices in ordering systems, inventory management, development models (e.g., Waterfall), black-box testing, and software quality (ISO/IEC 25010), as well as justification for a mobile application architecture with a lightweight backend. The Data Collection phase crystallizes requirements through observation, interviews, and document audits into user stories, business rules, and core data models (customers, products/variants, preorders, payments, deliveries, status history). System Design then designs the architecture, use cases/flows, ERD, validation (qty, variants, DP, state machine status), UI/UX design, and role-based access control. Finally, System Testing verifies compliance through key scenarios (create PO, change status, payment, reports, edge cases) and non-functional tests, producing a test report and go-live checklist—the entire sequence ensures that the solution is on target, measurable in terms of accuracy, traceability, efficiency, reliability, and ease of use.
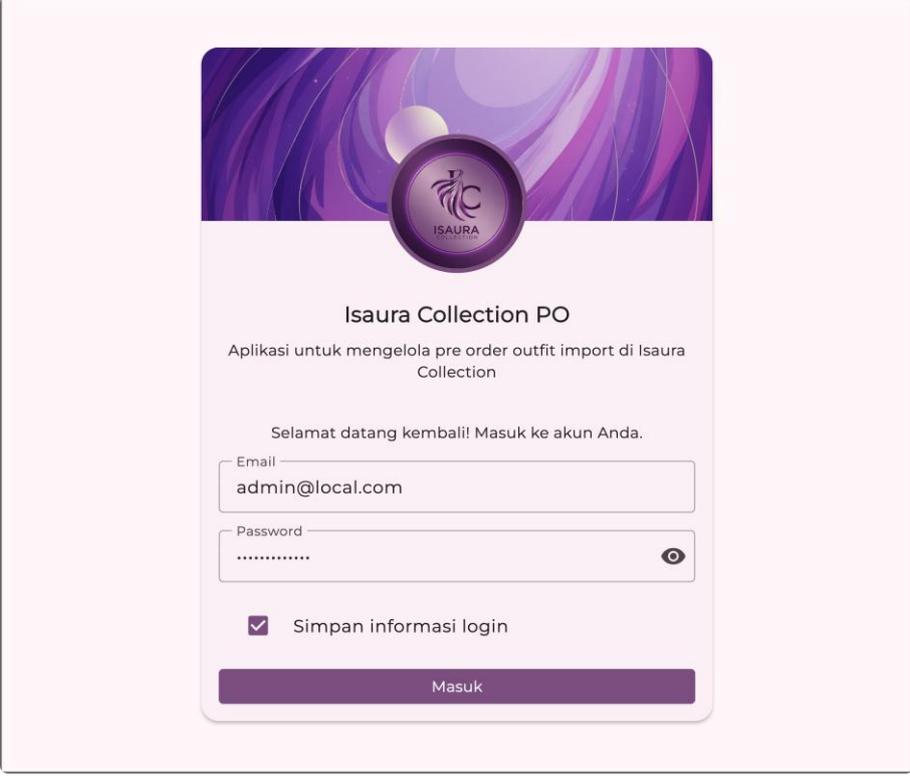
Results

The user interface of the Isaura Collection's imported outfit pre-order (PO) data collection system is designed to provide an intuitive and efficient user experience. The system was

developed using Flutter and Dart for web-based platforms, ensuring optimal accessibility for users on various devices. The interface was designed with a user-centered approach, prioritizing ease of navigation, clarity of information, and responsiveness. Each interface element, such as forms, dashboards, and reports, is designed to support Isaura Collection's business processes, from customer registration to delivery reporting. The visual design uses a color scheme consistent with the Isaura Collection brand identity, with a layout that supports operational efficiency. Key features include customer data management, products, pre-orders, payments, and shipping, as well as integrated reports to support decision making. The interface utilizes Pocketbase as the backend to ensure fast and secure data management, with SQLite as the database to support CRUD operations.

Form Login

Figure 2 shows The login form is designed for user authentication, whether admin, staff, or customer. This interface contains email and password fields, with a 'Login' button to start the session. The design is minimalist with a focus on security, using Pocketbase for credential validation. An error message appears if the credentials are incorrect, and a 'Forgot Password' link is provided for account recovery. The interface supports quick navigation to the dashboard after successful login, utilizing Flutter Navigator for smooth page transitions.

Figure 2. Form Login

Form Dashboard

Figure 3 shows the dashboard is the system's navigation center, displaying data summaries such as the number of active pre-orders, payment status, and pending deliveries.
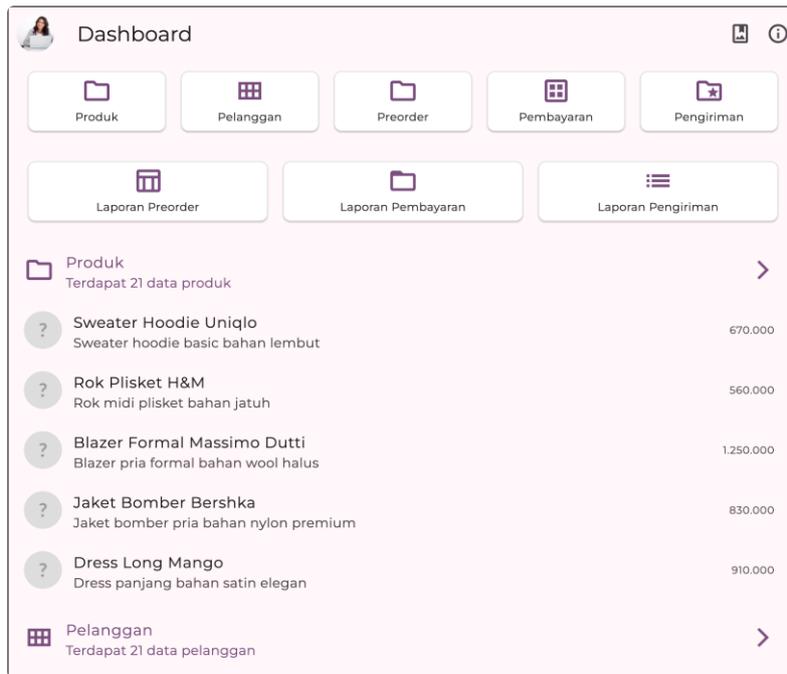
Figure 3. Form Dashboard

Customer List

Figure 4 shows the customer list displays all customers in a table format, with columns for name, email, and phone number. Each row has a button to view details or edit data. This interface uses DataTable from Flutter for structured data presentation, with search and sorting features for easy navigation. Data is retrieved from Pocketbase in real-time, ensuring that information is always up to date.
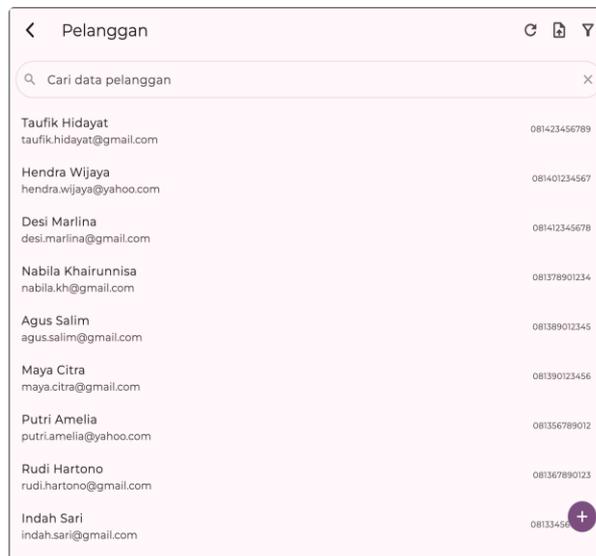

Figure 4. Customer List

Product List

Product List is a centralized catalog of all items that can be PO'd, serving as a single reference when admins place orders to ensure consistency in variants, prices, and status. It stores key data for each product and variant. Its functions include search/filter/sort, add-change-deactivate, bulk import (CSV), price history, and audit trail. Integration with the PO form enables product auto-suggest, variant/qty/price validation, and quick PO value calculationthereby reducing input errors and ensuring neat order tracking. Figure 5 shows the

The product list displays all products in card format using GridView. Each card displays the product image, name, and price, with buttons to view details or edit. The search and filter features allow users to find products quickly. Data is retrieved from Pocketbase in real-time, with a responsive design to support display on the web.
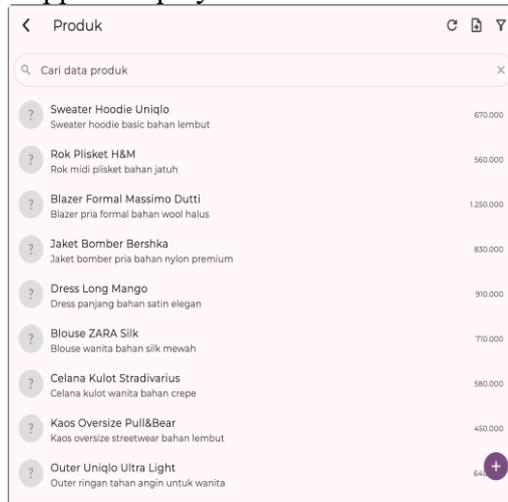

Figure 5. Product List

Preorder List

Figure 6 shows The pre-order list displays all orders in a table format, with columns for customer name, product, quantity, and status.
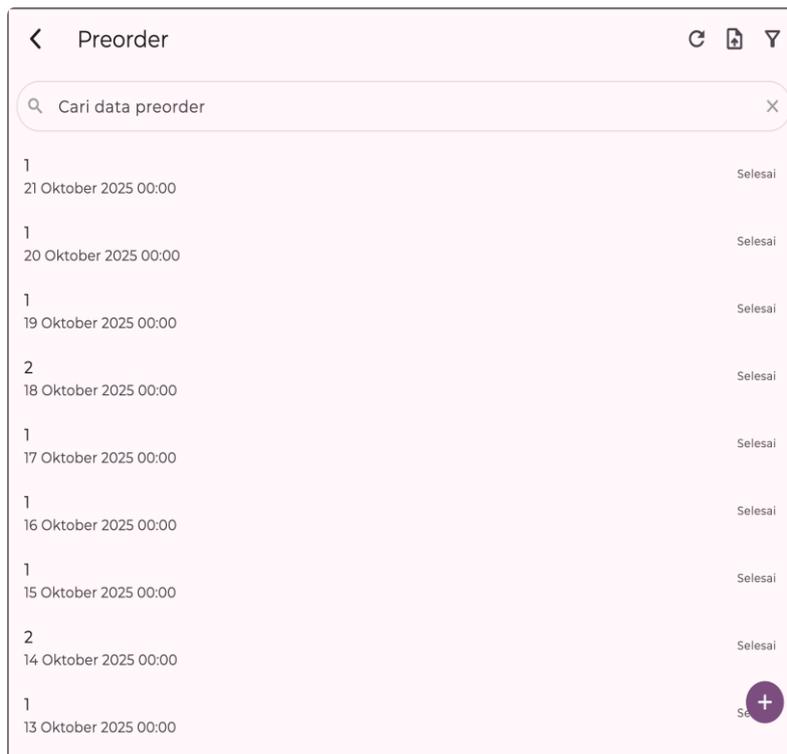
Figure 6. Preorder List

Payment List

Figure 7 shows The payment list displays all payment transactions in a table format, with columns for customer name, amount, and status. This interface uses DataTable for data

structure, with buttons to view details or edit. The search feature makes it easy to track payments. Data is retrieved from Pocketbase in real-time.
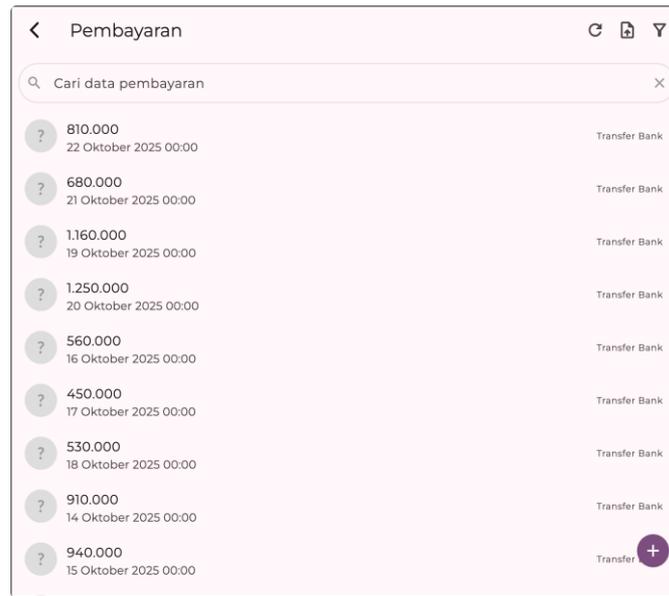

Figure 7. Payment List

Shipping List

A Shipping List is a shipping manifest that records every shipment of goods from suppliers to Isaura Collection. The status progresses step by step Confirmed → Shipped → In Transit → Customs → Arrived → Received—with any discrepancies (short/over/damaged) noted upon receipt. Its functions include consolidating multiple POs into a single shipment, tracking location & ETA, calculating landed cost, preparing printed documents (packing list/manifest), and reconciliation upon receipt. This module is integrated with POs and inventory: changes in shipment status update PO status, add stock upon goods receipt, and trigger notifications in case of delays. Figure 8 show the shipping list displays all shipments in a table format, with columns for tracking number, courier, and status. This interface uses DataTable for data structure, with buttons to view details or edit status. Data is retrieved directly from Pocketbase.
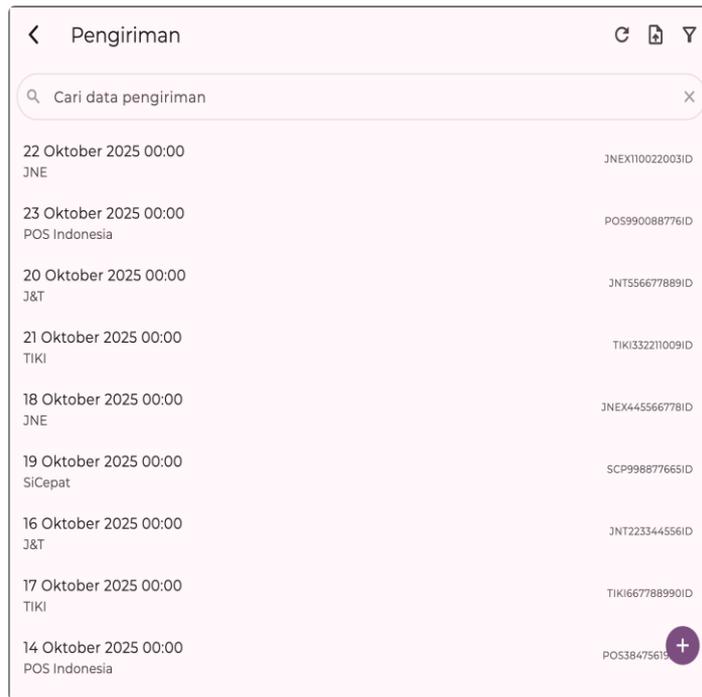
Figure 8. Shipping List

Preorder Report

Figure 9 show the pre-order report displays a summary of all orders within a specific period, with columns for customer, product, quantity, and status. This interface uses DataTable for data structure, with date filters to narrow down results. Data is retrieved from the view collection in Pocketbase for query efficiency.
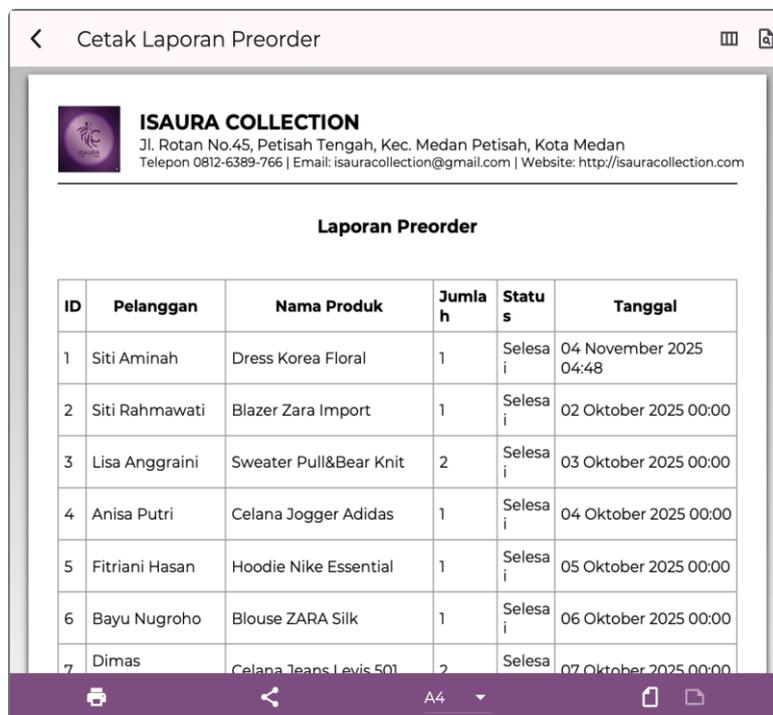

Figure 9. Preorder Report

Payment Report

Figure 10 show the payment report displays a summary of all payment transactions within a specific period, with columns for customer, amount, and payment method.

Figure 10. Payment Report

Delivery Report

Figure 11 show the shipping report displays a summary of all shipments within a specific period, with columns for tracking numbers, couriers, and status.

Figure 11. Delivery Report

Conclusion

The study concluded that the pre-order data collection system for imported outfits at Isaura Collection successfully provided an integrated digital solution that automates the pre-order process with high accuracy, presents a user-friendly interface that improves the efficiency of administrators, staff, and customers, and utilizes PocketBase and SQLite integration for secure and efficient data storage. Pre-order, payment, and shipping reports are also available in real-time, supporting business analysis and proven stability in Isaura Collection's operational environment in Medan. For future improvements, it is recommended to add automatic notifications (email or push) for status changes, implement offline mode to remain functional when the connection is lost, expansion of report search filters (e.g., product status and category), tightening of input validation including trimming of excess spaces, and optimization of report

export to PDF to handle large data sets a series of improvements aimed at strengthening system performance, reliability, and scalability.

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